Appendix K

Well Bore
And
Completion
Diagrams
For
Monitoring Wells

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 1 of 3
Project Number: 4423-0220
Hole Number: BH06

Project: AMS No. 7 ESI
Location: AMS No 7, Vernon Texas
Coordinates: (N) 7543291.90 (E) 1719524.29
Drilling Contractor: Horizon Drilling
Drill Make and Model / Drilling Method: Longyear BK-81 / HSA
Depth Top Rock: 76.7'
Depth Casing & Size: NA
Hole Size: 8"
Elevation: 1365.0 (MSL)
Angle from Vert. and Bearing: N/A
Depth Bottom of Hole: 79.0'
Water Level: 21.5' 18.3' (in core) (in open hole)
Fluid & Additives: Mud (100% bentonite)
Date Start: 7/19/00
Date Finish: 7/19/00
Logger: Phil Hammons

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL (Time)	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.)
	0	(0-0.5') 1200	AMS7-BH06-S-00 PID=0.0 chemical	5.0/5.0			SAND WITH SOME SILT (SM), moderate brown (5YR 4/4), v. fine grained, quartoze, 15% silt, dry (Upper several ft probable AF due to closure activities).
							PID=0.0
	5	15.0-16.0 1405	-05 PID=0.0 chemical				grades to grayish orange (10YR 7/4)
				5.0/5.0			PID=0.0
	10	10.0-11.0' 1415	-10 chemical PID=0.0				laminated moderate reddish brown (10R 4/6) and very pale orange (10YR 8/2)
				5.0/5.0			PID=0.0
							gradational
	15	(16.0-18.0) 1425	-18 (QA/QC) chemical PID=0.0				SAND (SP), moderate reddish brown (10R 3/4 4/6), v. fine grained, quartoze, no silt
				5.0/5.0			PID=0.0
18.2' (in core)							Very silty sand (SM), moderate reddish brown (10R 4/6), very fine grained, quartoze, 30% silt, saturated
	20						20.5' grades to silty Sand (SM), light brown (5YR 5/6), 15-20% silt
							PID=0.0
				3.0/5.0			SANDY CLAY (CL), pale yellowish brown (10YR 6/2), 20% v. fine grained sand, low plasticity, saturated
	25						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 2 of 3
Project Number: 4423-0220
Hole Number: BH 06

Project: AMS No.7 ESI
Location: AMS No.7 Vernon, Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content)
				5.0/5.0			CL (as above) gradational CLAYEY SAND (SC), light brown (5YR 5/6), v. fine grained, quartzose, 15-40% clay, soft, saturated. PID = 0.0
	30			4.8/5.0			SANDY CLAY (CL), very pale orange (10YR 8/2), 25-30% v. fine grained sand, stiff, abundant caliche nodules (2-3mm diam.) PID = 0.0
	35			4.0/5.0			Silty SAND (SM), mottled light brown (7.5YR 5/6) and very pale orange (10YR 8/2), v. fine grained, quartzose, 10-20% silt, soft, flowing sand PID = 0.0
	40			2.1/5.0			SAND (SP), light brown (5YR 5/6), v. fine grained, subrounded to subangular, soft, flowing sand PID 0.0
	45			1.0/5.0			PID = 0.0
	50			1.3/5.0			- grades to rounded grains PID = 0.0
	55						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 3 of 3
Project Number: 4423-0220
Hole Number: BH06

Project: AMS No.7 ESI
Location: AMS No.7 Vernon, Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL (Time)	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION: Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.
							SAND (SP) as above
				1.7/5.0			PID = 0.0
	60						
				1.6/5.0			PID = 0.0
	65						
							PID = 0.0
				.0/5.0			SILT (ML), light brown (5YR 6/4), hard.
	70						
				2.6/5.0			SAND (SP) as above
							PID = 0.0
	75	15.5-76.5 (10.5')	AMS7-BH06-5-76 Chemical PID = 0.0				Top of bedrock at 76.7'
				3.2/5.0 / 2.0 push			SANDSTONE, moderate reddish brown (10R 4/6), very fine grained, trace silt, faint low angle x-bedding, highly weathered.
							T.D. at 79.0'
	80						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 1 of 4
Project Number: 4423-0220
Hole Number: BH-07

Project: AMS NO. 7 ESI
Location: AMS No. 7/Vernon TEXAS
Coordinates: (N) 7543371.68 (E) 1719805.76
Drilling Contractor: Horizon Drilling
Drill Make and Model / Drilling Method: Longyear BK-81
Depth Top of Rock: 85.5'
Depth Casing & Size: NA
Hole Size: 8"
Elevation: 1367.0 (MSL)
Angle from Vert. and Bearing: NA
Depth Bottom of Hole: 87.0'
Water Level: 11.3' (in open hole) 10' (in core)
Fluid & Additives: Insta-Vis Liquid Polymer
Date Start: 7/17/00
Date Finish: 7/18/00
Logger: Phil Hammons

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL (Time)	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION: Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content
	0	0-1.5' (1510)	AMST-BH07-5-00 (Chemical) PID=0	3.3/5.0			SAND (SM), moderate reddish brown (10R 4/6), very fine to medium grained, 10% silt, 5% gravel, trace caliche nodules, Artificial Fill, soft
							PID = 0.0'
	5	5-6' (1520)	-05 (Chemical) PID=0	1.8/5.0			(as above)
							approximate
	10	(10-11') (1525)	-10 (Chemical) PID=0	2.0/5.0			SAND (SP), grayish orange (10YR 7/4), medium to coarse grained, subrounded to rounded grains, quartzose saturated at 10.0' in core, soft (AF?)
							wp with some silt (SM), mottled moderate reddish brown (10R 4/6) and light brown (5YR 5/6), very fine grained, trace medium grained, quartzose, 15% silt, soft
	15			2.5/5.0			PID = 0.0
							approximate
	20			5.0/5.0			CLAYEY SAND (SC), laminated light brown (5YR 5/6) and moderate yellowish brown (10YR 5/4), fine grained, quartzose, 35% fines, trace caliche nodules stiff
							PID = 0.0
	25						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 2 of 4
Project Number: 4423-0220
Hole Number: BH-07

Project: AMS No. 7 ESI
Location: AMS No. 7, Vernon Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content)
				5.0/5.0			(as above) PID = 0.0
	30			5.0/5.0			trace gravel (up to 1" diameter), some caliche nodules and layers PID = 0.0
	35			3.8/5.0			SAND with some gravel (SW), moderate yellowish brown (10YR 5/4), fine grained, gravel up to 1.5" diameter, soft (36.0-76.8')
							CLAYEY SAND (SC), laminated, pale olive (10Y 6/2) and moderate yellowish brown (10YR 5/4), fine grained, 20% clay, stiff
	40			4.0/5.0			approximate SAND with some SILT (SM), mottled light brown (5YR 5/6) and grayish orange (10YR 7/4), V. fine grained, trace clay, flowing sands PID = 0.0
	45			3.8/5.0			approximate SAND (SP), light brown (5YR 6/4), fine grained, poorly graded, trace silt, quartoze, flowing sands PID = 0.0
	50			4.0/5.0			(as above) Core barrel stuck in augers due to flowing sand on 50-55' run. Could not dislodge. Had to pull augers and rods out of hole to dislodge and go back in.
	55						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Project Number: 4423-0220
Hole Number: BH-07

Project: AMS No. 7 ESI
Location: AMS No. 7, Vernon, Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE: INTERVAL	SAMPLE: TYPE & NUMBER	SAMPLE: % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION: Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.
	55–65			X	X	X	Drilled ahead without sampling from 55-65'. AT 65' added Insta-Vis liquid Polymer to mud pit to bring up cuttings and flush out HSA. (A CETCO product)
	60						From 65'-86', switched from continuous sampling to drive sampling with downhole hammer and 2' spoons (2" diameter)
	65			0.9/2.0'			SAND (SP) as above, flowing sands
				0.7/2.0'			PID=0.0
	70			0.4/2.0			
				1.0/2.0			PID=0.0
				2.0/2.0			
	75			1.3/2.0			SANDY SILT (ML), light brown (5YR 5/6), sand is v. fine grained (30%), trace clay.
				1.0/2.0			SAND (SP) as above PID=0.0
	79–83			X		X	Drilled ahead without sampling from 79'-83' ~~86'~~ push
	80						
	83–85	845-85.5' (1740)	AMS7-BH07-S-85 (chemical) PID=0.0	3.0/4.0			SAND (SP) as above
	85						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 4 of 4
Project Number: 4423-0221
Hole Number: BH-07

Project: AMS No. 7 ESI
Location: AMS No. 7 Vernon, Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.)
				3/4			SAND (SP) as above — TOP OF BEDROCK @ 85.5'
							SANDSTONE, moderate reddish brown (10R 4/6), silty, hard
							T.D. @ 87.0'
90							
95							

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 1 of 3
Project Number: 4423-0220
Hole Number: BH-08

Project: AMS No. 7 EST
Location: AMS No. 7, Vernon Texas
Coordinates: (N) 7543550.53 (E) 1719815.19
Drilling Contractor: Horizon Drilling
Drill Make and Model / Drilling Method: Long Year BK 81 / HSA
Depth Top of Rock: 80.5'
Depth Casing & Size: NA
Hole Size: 8"
Elevation: 1362.5 (msl)
Angle from Vert. and Bearing: N/A
Depth Bottom of Hole: 85.0'
Water Level: 15.0' in 18.5' in core open hole
Fluid & Additives: Mud / Bentonite (100%)
Date Start: 7/20/00
Date Finish: 7/20/00
Logger: PHIL Hammonds

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL (TIME)	SAMPLE TYPE & NUMBER / PID	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION: Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.
		0'-0.5' 7/20/00 (1205)	AMS7-BH08-S-00 chemical PID=0.0	3.0 5.0			SAND (SP), light brown (5YR 5/6), v. fine grained, trace silt dry.
		0.5-6.0' 7/20/00 (1250)	0.5-5' chemical	5.0 5.0			approximately SILTY SAND (SM), mod. reddish brown (10R 4/6), v. fine grained 15% silt, trace gravel (rounded <1" diameter), abundant caliche nodules (2-4" diam.).
5							from 5-15' slight oil odor
		10.0-11.0' (1300)	5-10 chemical	5.0 5.0			
10							grades to light brown (5YR 5/6) with some very pale orange (10YR 8/2) mottling
		15.0-16.0' (1325)	10-15' chemical PID>2000 ppm (5-15')	5.0 5.0			trace caliche nodules (2-4 mm)
15							silt content increases to 30%
	16.5-18.5' (1340)		15-18.5' chemical	5.0 5.0			
	incore 18.5'						SANDY CLAY (CL), light brown (5YR 5/6), v. fine grained sand (35%), some caliche nodules, low plasticity.
20			PID=0.0	3.5 5.0			
25							

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 2 of 3
Project Number: 4423-0220
Hole Number: BH-08

Project: AMS No. 7 ESI
Location: AMS No. 7, Vernon TX.

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION
							Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.
			PID ϕ.ϕ	5.0/5.0			SANDY CLAY (CL) as above 25-27' - grayish orange (10YR 7/4) with abundant caliche nodules (3-7mm diam). - grades to light brown (5YR 5/6) without caliche
30			PID ϕ.ϕ	5.0/5.0			30.0-32.2 grayish orange (10YR 7/4), abundant caliche nodules (3-7mm) - grades to l. brown (5YR 5/6) gradational
35			PID ϕ.ϕ ppm	4.0/5.0			SILTY SAND (SM), light brown (5YR 5/6), v. fine grained, quartzose, well rounded, 20% silt, trace clay, soft, flowing sand
40			PID ϕ.ϕ	1.3/5.0			
45			PID ϕ.ϕ	1.0/5.0			SANDY SILT (ML), mod. orange pink (5YR 8/4), 15% v. fine sand, hard
50			PID ϕ.ϕ	4.1/5.0			SAND WITH SOME SILT (SM), l. brown (5YR 5/6), v. fine grained, quartzose, well rounded, 10% silt, flowing sand, soft
55							

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 3 of 3
Project Number: 4423-0220
Hole Number: BH-08

Project: AMS No. 7 ESI
Location: AMS No. 7, Vernon Tx

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER / PID	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content)
							SAND WITH SOME SILT (SM) as above
			PID ϕ.ϕ	1.0/5.0			
	60		PID ϕ.6	0.6/5.0			
	65		PID ϕ.6	2.2/5.0			VERY SANDY SILT, l. brown (5YR 6/4), 10% v. fine gr. sand, stiff.
							SAND (SP), light brown (5YR 6/4), v. fine grained, quartzose, rounded, flowing sand.
	70		PID ϕ.6	1.2/5.0			
	75			1.0/5.0			
	80	(80.1-80.5') 1730	S-80 (EB) chemical PID=ϕ.ϕ				Top of Bedrock at 80.5'
				2.8/5.0			SANDSTONE, Mod. reddish brown, v. fine grained; faint low angle x-bedding; highly weathered
							T.D. at 85' bgs

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 1 of 4
Project Number: 4423-0220
Hole Number: BH-09

Project: AMS NO.7 ESI
Location: AMS No.7, Veron Texas
Coordinates: (N) 7543566.68 (E) 1719814.85
Drilling Contractor: Horizon Drilling / Peterson Drilling
Drill Make and Model / Drilling Method: Gardner-Denver 1500 / Mud Rotary
Longyear BK-81/Air Rotary/Mud Rotary
Depth Top of Rock: ~~84'~~ 80.5'
Depth Casing & Size: Isolation Casing 91'/8 5/8" (STK 21)
Hole Size: 0-95' (12 1/4") 95'-210' (8 3/4")
Elevation: NR-1362.82 (MSL)
Angle from Vert. and Bearing: Borehole Ream w/ Drillteck D40K
Depth Bottom of Hole: 210'
Water Level:
Fluid & Additives: 0-95' - Bentonite Mud 95'-188' - None
Date Start: 7/12/00
Date Finish: 8/03/00
Logger: PHIL HAMMONS

ELEVATION	DEPTH BELOW SURFACE ft	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	% RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION: Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.
	0	N/A	N/A	N/A			Drilled from 0.0' to 88' bgs with 4.25" tricone; logged cuttings (see log of adjacent Borehole BH08 for lithologies)
	10						
	20						▽ approximate depth to groundwater
	30						
	40						
	50						

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 2 of 4
Project Number: 4423-022C
Hole Number: BH-09

Project: AMS No.7 ESI
Location: AMS No. 7, Vernon Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content)
							See log of adjacent Borehole BH08 for lithologies
	60						
	70						
	80						Top of Bedrock at 80.5' (based on contact encountered in adjacent BH08)
							weathered bedrock
							unweathered bedrock at 84.0' based on drilling change
	90	Boring isolated casing		5.0/5.0	N/A		SANDSTONE, moderate reddish brown (10R 4/6), v. fine grained, quartzose, prominent low angle cross-bedding, hard dry
		91.0'					Reamed pilot (4.25") borehole with 12.25" tricone bit from 0.0' to 98' bgs. Set 8 5/8" steel casing to 91' bgs and grouted in place.
							Begin Air Coring at 98.0' on 7/19/00
	100						SILTSTONE N:TH some sand, moderate reddish brown (10R 4/6), sand is v. fine, rare (10%), dry, possible water bearing fractures
			ϕ.ϕ	6.5/10	NA		SILTY SANDSTONE, moderate reddish brown (10R 4/6), sand is v. fine grained, quartzose, 25-30% silt, dry, low angle x-l
							approximate
	110			5.7/10	NA		SANDSTONE, pale reddish brown (10R 5/4) with pale olive (10Y 6/2) mottling, v. fine grained, quartz and lithic fragments, abundant elongate shale clasts mm-cm, prominent low angle x-bedding, some (2-10 mm) solution cavities, some filled w/ crystals.

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

BOREHOLE LOG

Sheet 3 of 4
Project Number: 4423-0220
Hole Number: BH-09

Project: Ams No. 7 ESI
Location: Ams No. 7, Vernon Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION: Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content.
							as above
			ϕ.ϕ	5.7/10	NA		SANDY SHALE, pale reddish brown (10 R 5/4) with pale olive (10 Y 6/2) mottling - sand is vi fine grained (20-30%)
							approximate
							SANDSTONE, Pale reddish brown (10 R 5/4), v. fine, rained, quartzose, low angle x-bedding, moderately cemented.
	120		ϕ.ϕ	6.8/10	NA		122'-128' - clayey
							131.5 - 134.0 mottled pale olive (10y 6/2) with abundant shale clasts
	130		ϕ.ϕ	8.7/10	NA		(from 116-138' - loss g ≈ 100 gallons to Fm.)
							138.5'-140.2' mottled pale olive (10y 6/2) with abundant shale clasts
	140		ϕ.ϕ	4.9/10	NA		140.2'-142.9' - weakly cemented
							weakly cemented, no noticeable x-bedding
	150		ϕ.ϕ	3.0/10	NA		
							159.2'-160.7' - mottled pale olive (10y 6/2) with abundant shale clasts
	160		ϕ.ϕ	6.0/10	NA		160.7'-164.0' - weakly cemented
							(from 138-168' loss g ≈ 160 gallons to Fm.) Drillers added Insta-Vis liquid Polymer at 168' (Flushed out pit prior to ce
							168.0'-170.6' well cemented, abundant solution cavities (1-4 mm prominent x-bedding (low angle)
	170			6.0/10	NA		

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES GROUP

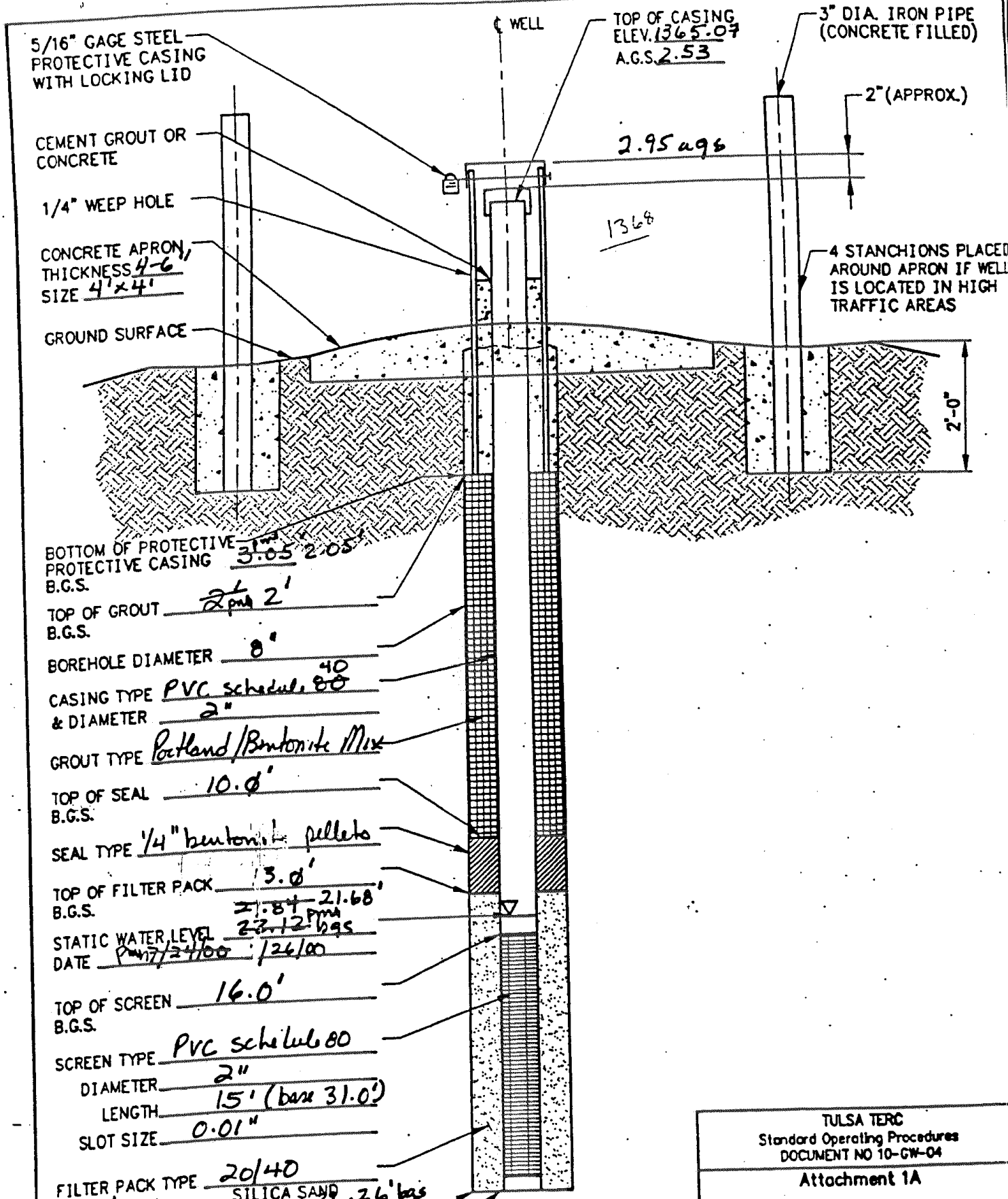
BOREHOLE LOG

Sheet 4 of 4
Project Number: 4423-022C
Hole Number: BH-09

Project: AMS No. 7 ESI
Location: AMS No. 7, Vernon, Texas

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE & NUMBER	SAMPLE % RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SYMBOLIC LOG	SOIL DESCRIPTION (Name, color, grain size, sorting (or gradation), plasticity, weathering, mineralogy, inclusions, angularity, moisture content)
							170.5-171.5 - weakly cemented
			0.7	6.0/10	NA		SILTSTONE, greenish gray (5G 6/1), shaley in areas, sand content (5%) weakly cemented
							approximate SHALE, moderate reddish brown (10R 4/6) with thin bands of greenish gray (5G 4/1)
180							178'-180' - soft, wet 180'-181.8' very hard, dry 181.8-184' - alternating soft and hard, dry
			2.6	6.1/10	NA		
190			>2000	4.8/5			moderate reddish brown (10R 4/6) with occassional greenish gray (5G 4/1) spots, very hard, dry, fractures in areas (possible water bearing).
			>2000	5.0/5.0			
200			>2000	3.7/5.0			
			NR	2.1/5.0			low battery on PID, lamp will not light
			NR	1.4/2.0			T.D. at 210' bgs
210							
220							
230							

MW06



TULSA TERC
Standard Operating Procedures
DOCUMENT NO 10-GW-04

Attachment 1A

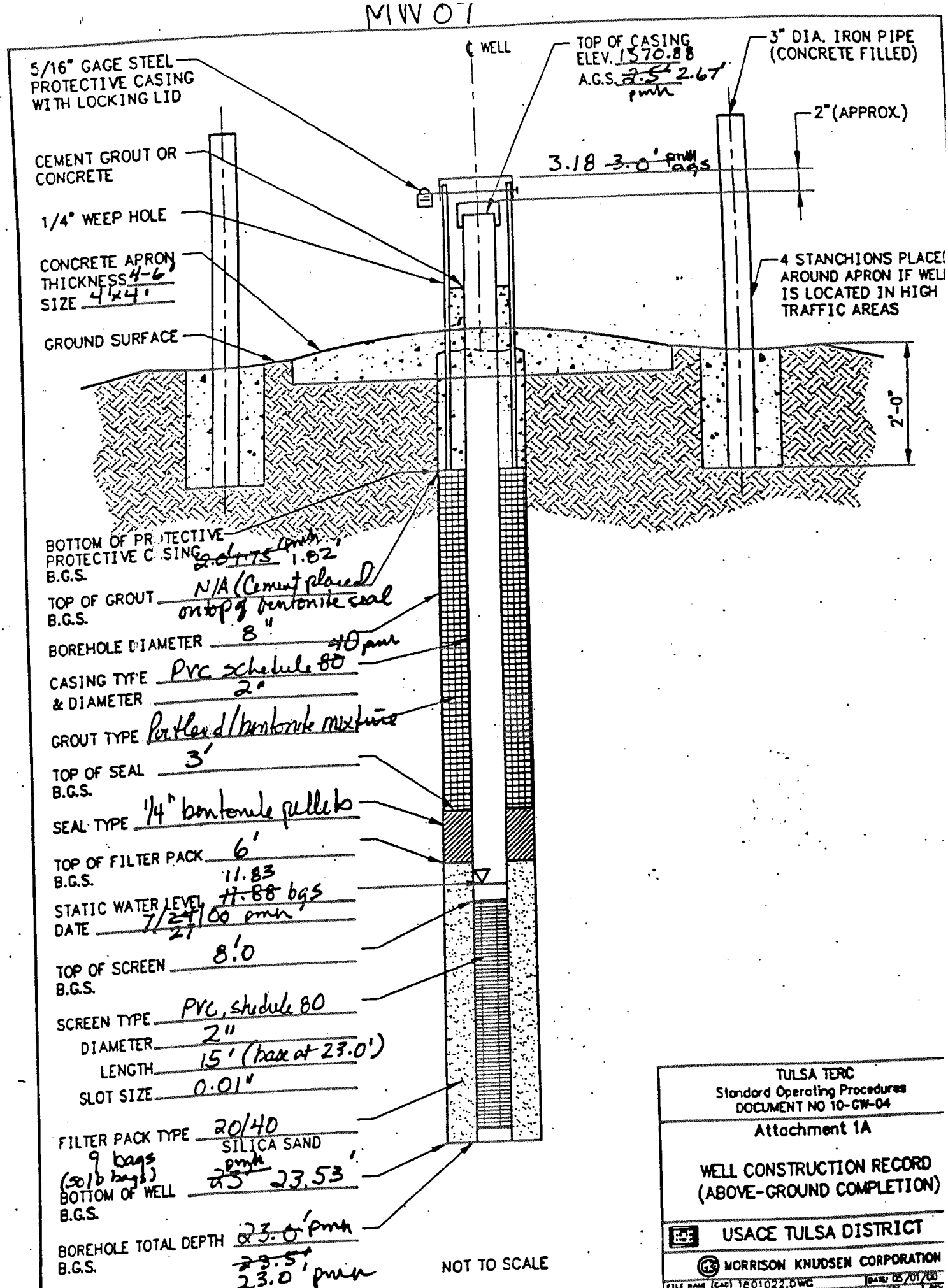
WELL CONSTRUCTION RECORD
(ABOVE-GROUND COMPLETION)

USACE TULSA DISTRICT

MORRISON KNUDSEN CORPORATION

FILE NAME (CAD) 1801022.DWG DATE 05/01/00
WORK ORDER | TASK | DRAWING NO. | REV.

MW 07



TULSA TERC
Standard Operating Procedures
DOCUMENT NO 10-GW-04

Attachment 1A

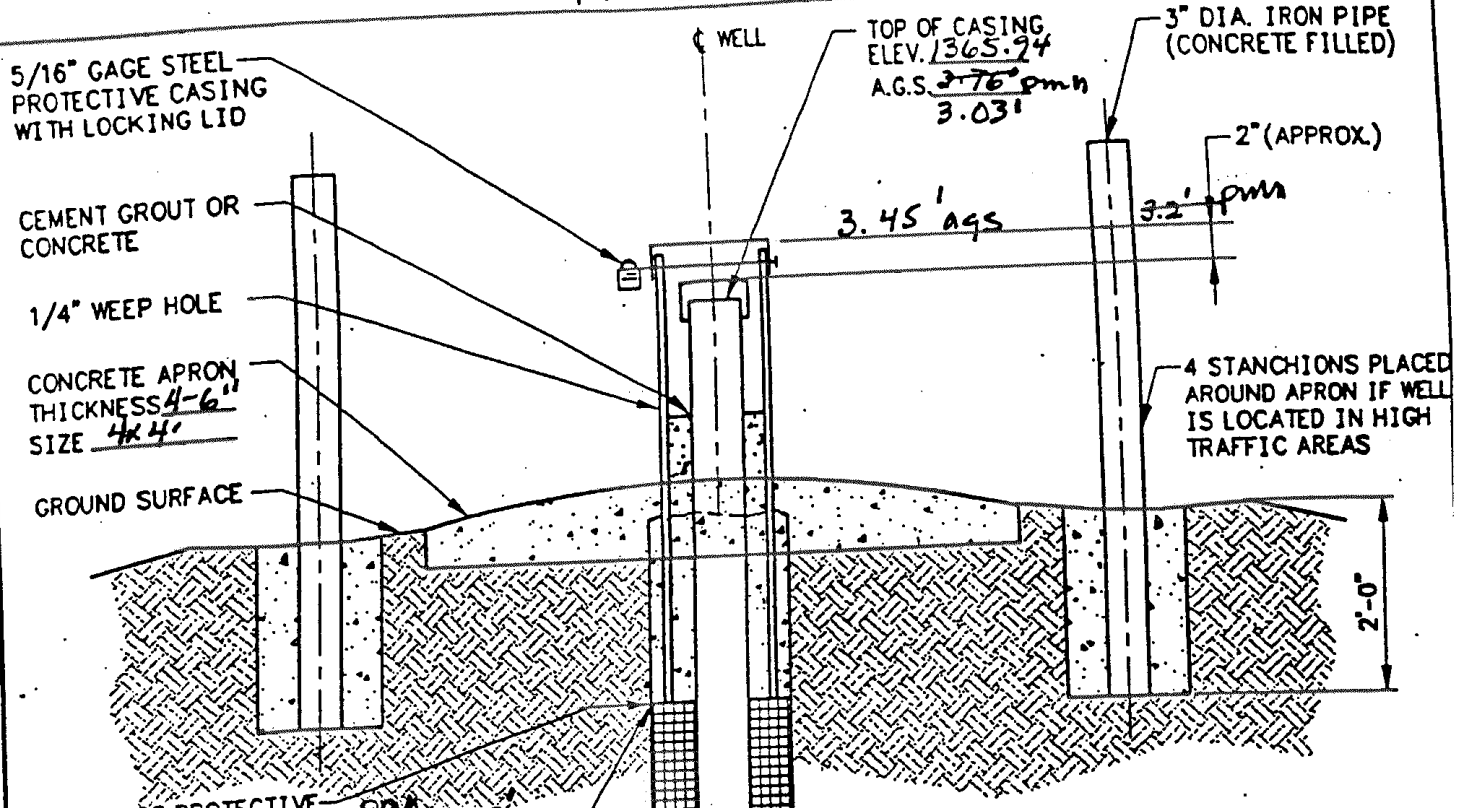
WELL CONSTRUCTION RECORD
(ABOVE-GROUND COMPLETION)

USACE TULSA DISTRICT

MORRISON KNUDSEN CORPORATION

FILE NAME (CAD) 1801022.DWG DATE: 05/01/00

MW 08



BOTTOM OF PROTECTIVE CASING B.G.S. pvmt +8 1.55'

TOP OF GROUT B.G.S. 3.0'

BOREHOLE DIAMETER 8"

CASING TYPE & DIAMETER PVC schedule 80 40, 2"

GROUT TYPE Portland/Bentonite Mixture

TOP OF SEAL B.G.S. 5.0'

SEAL TYPE 1/4" bentonite pellets

TOP OF FILTER PACK B.G.S. 8.0'

STATIC WATER LEVEL pvmt 20.52' bgs 20.30'

DATE pvmt 7/24/2007/26/00

TOP OF SCREEN B.G.S. 10.0'

SCREEN TYPE PVC schedule 80

DIAMETER 2"

LENGTH 15'

SLOT SIZE 0.010"

FILTER PACK TYPE 20/40 SILICA SAND

10.5 bags (50lb bags)

BOTTOM OF WELL B.G.S. 25.0'

BOREHOLE TOTAL DEPTH B.G.S. 25.0'

NOT TO SCALE

TULSA TERC
Standard Operating Procedures
DOCUMENT NO 10-GW-04

Attachment 1A

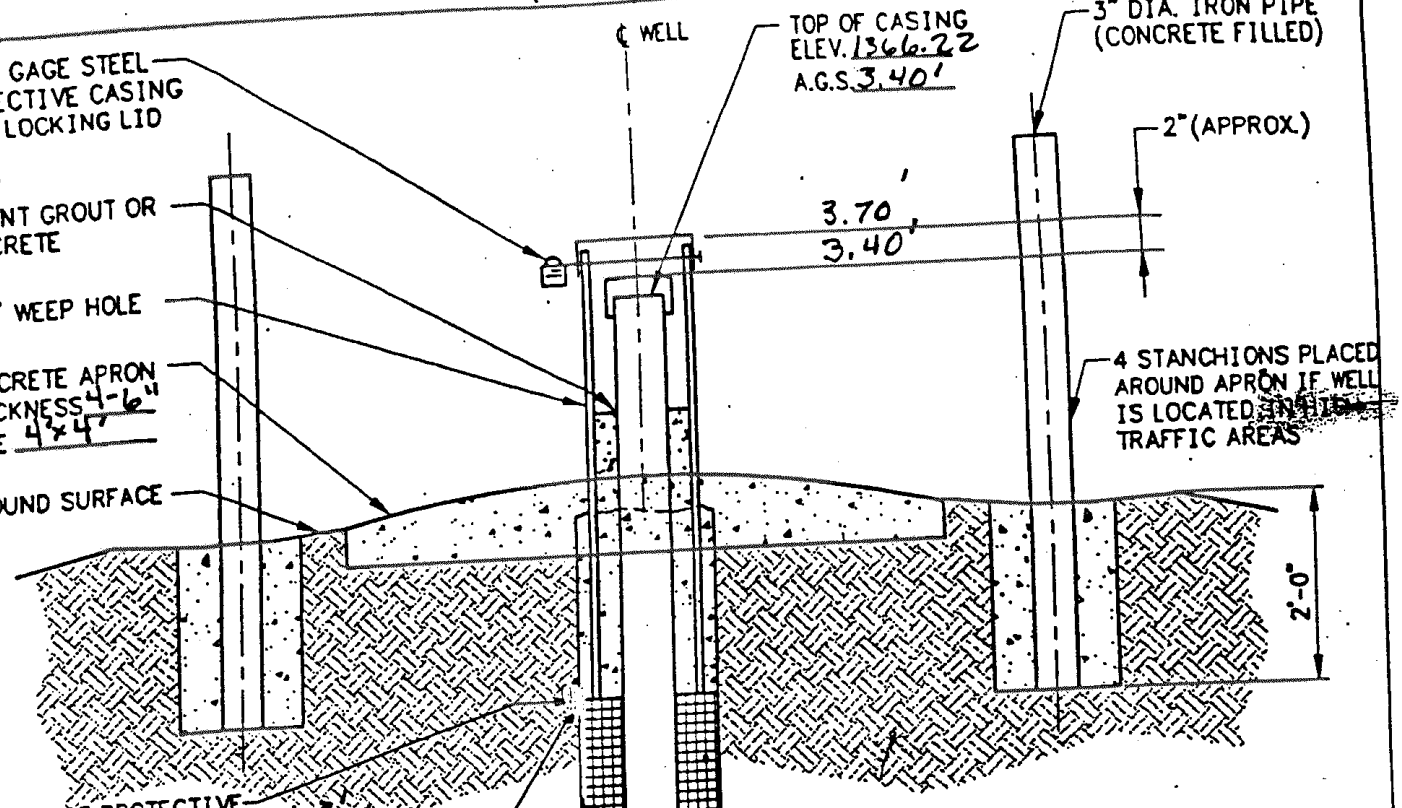
WELL CONSTRUCTION RECORD
(ABOVE-GROUND COMPLETION)

USACE TULSA DISTRICT

MORRISON KNUDSEN CORPORATION

FILE NAME (CAD) 1801022.DWG DATE: 05/01/00

MW09



BOTTOM OF PROTECTIVE PROTECTIVE CASING B.G.S. 1.3' bgs

TOP OF GROUT B.G.S. 1.5'

BOREHOLE DIAMETER 8.0"

CASING TYPE & DIAMETER PVC Schedule 80 4"
S.S. Centralizers every 20' on casing starting at top of screen.

GROUT TYPE Portland Type I/II Bentonite Mixture
320 gal

TOP OF SEAL B.G.S. 146'

SEAL TYPE Bentonite Slurry
110 gal.

TOP OF FILTER PACK B.G.S. 182'

STATIC WATER LEVEL

DATE 8/14/00

TOP OF SCREEN B.G.S. 186' bgs
Bottom 211' bgs

SCREEN TYPE PVC schedule 80

DIAMETER 4"

LENGTH 25'

SLOT SIZE 0.010"

FILTER PACK TYPE 20/40 SILICA SAND
15 bags

BOTTOM OF WELL B.G.S. 211.5

BOREHOLE TOTAL DEPTH B.G.S. Cored to 210', Reamed to 220'

NOT TO SCALE

9" Bottom of Steel Isolation Casing (8 5/8" diam) (bgs)

Core hole reamed prior to this well w/ a DriTech D40K air rotary rig

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